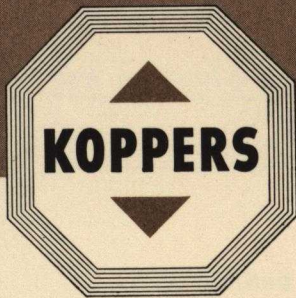


# KOPPERS PRESSURE-CREOSOTED FOUNDATION PILES



*Economical  
and Permanent*





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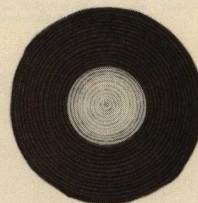
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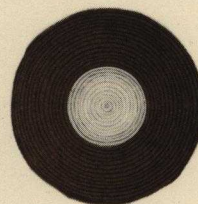


# I *ntroduction*

FOR MANY CENTURIES, it has been standard engineering practice to found heavy structures on wood piles. Today, that practice is still one of the simplest, most economical and most effective methods of providing strong, durable foundations.



Koppers Pressure-Creosoted Timber Piles provide permanent foundations; also, these piles are usually lower in cost than other permanent pile materials. Furthermore, they are quickly available; they are ready to drive when received; they are not affected by acid or alkaline soils.



In this booklet, in addition to other features, Koppers lists names and shows photographs of typical projects, large and small, old and new, which are founded on pressure-creosoted piles. Competent engineers are convinced that these structures will "speak for themselves."



# Experts describe Pressure-Creosoted Foundation Piles as *"Permanent construction"*

Competent authorities, when asked to give estimates of the probable life expectancy of pressure-creosoted foundation piles, have stated, "We consider such installations to be permanent construction."

In other words, the expected life is so high that experts think in terms of "permanency," not in terms of "years."

## Under certain conditions, Wood Foundation Piles must be Pressure-Creosoted!

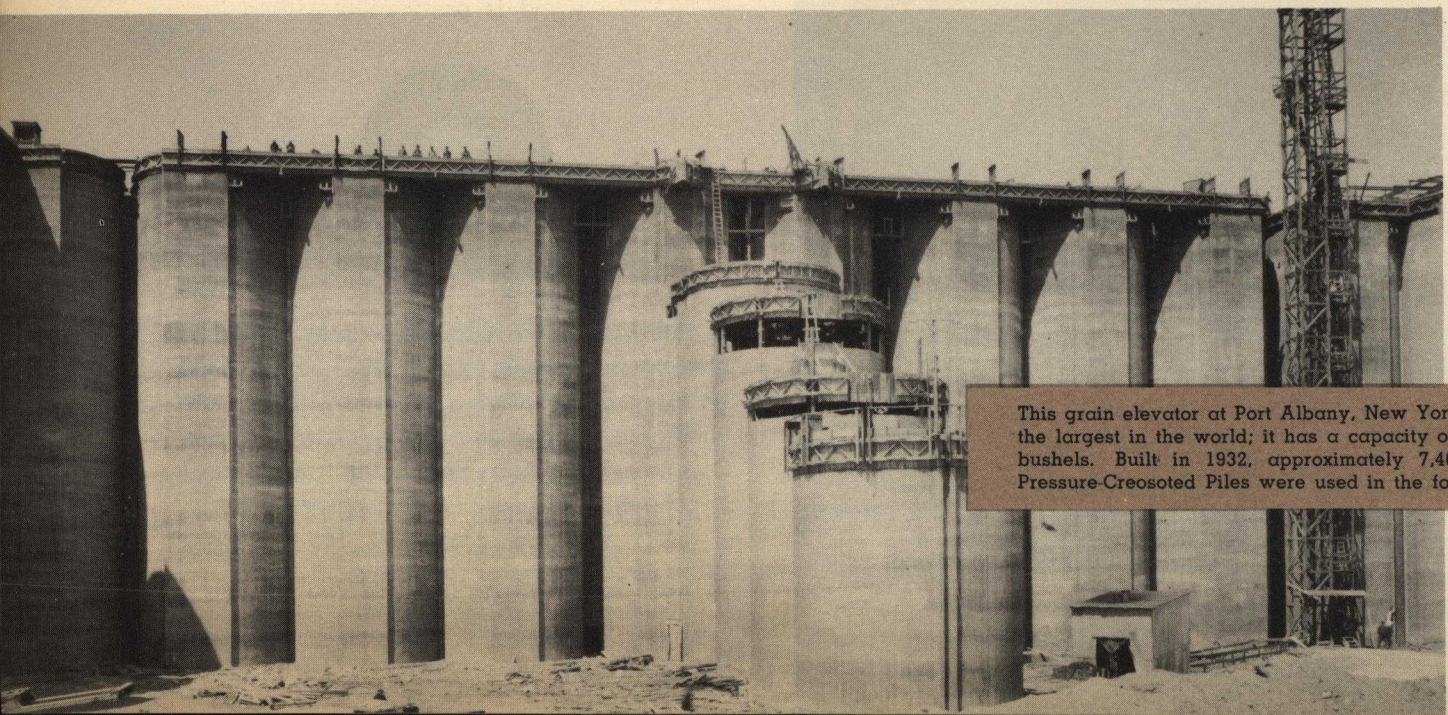
TIMBER PILES for foundations, even when the wood is untreated, are recognized by all authorities as "permanent construction," provided the piles are to be perpetually submerged in fresh water, or are to be completely embedded in the earth, with the cutoffs *below* the lowest ground-water level.

However, timber piles that are untreated are subject to decay and insect attack where they project *above* the water table and also above the ground surface.

Approximately 60 years ago, some of the larger

railroad companies started the practice of installing creosoted piles and cutting off *above* the permanent water level. During the past 30 years, this practice has become increasingly common, extending, to a marked degree, into the general construction field.

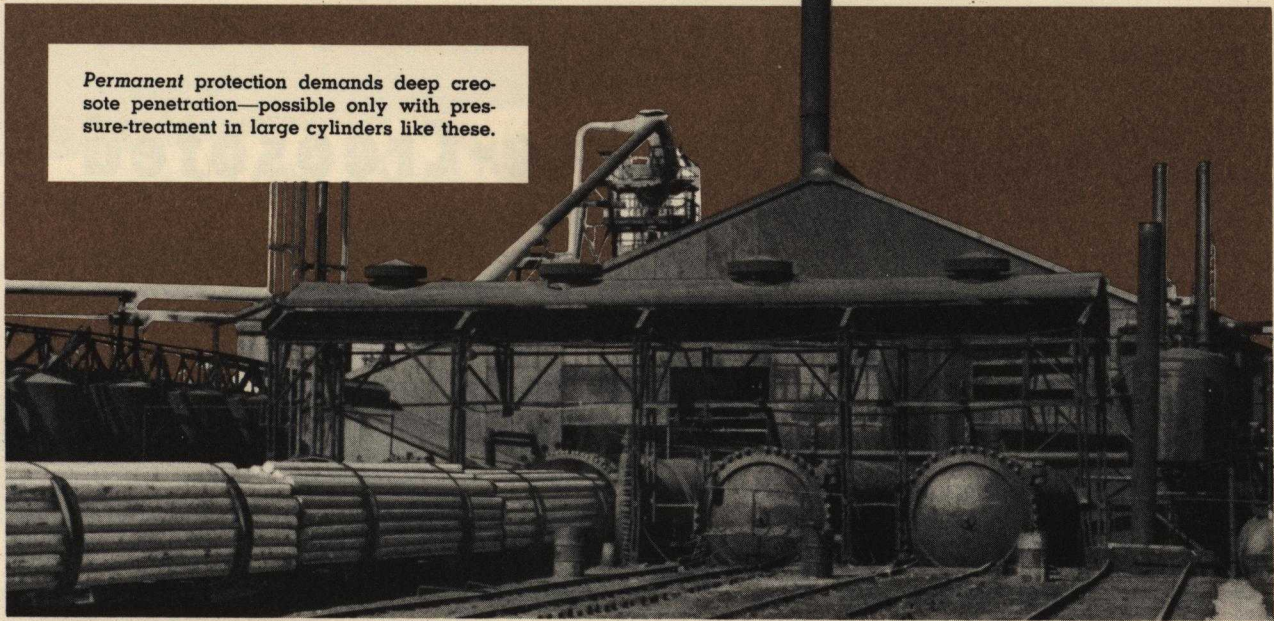
Obviously, under these conditions, and where there is any danger of subsidence of the water level, pressure-treatment with creosote is necessary in order to protect piles against decay and insect attack.



This grain elevator at Port Albany, New York, is one of the largest in the world; it has a capacity of 13 million bushels. Built in 1932, approximately 7,400 Koppers Pressure-Creosoted Piles were used in the foundation.



Permanent protection demands deep creosote penetration—possible only with pressure-treatment in large cylinders like these.



## Koppers Pressure-Creosoting Treatment protects piles against decay... makes them

*"Permanent construction"*



For maximum protection, and, in order to conform with recommended building-code specifications, cutoffs should be soaked in creosote and capped in concrete as shown in this photo.

KOPPERS takes straight, sound wood—wood that has passed strict inspection tests and has been properly seasoned—then pressure-treats it with creosote. The wood is pressure-treated in large cylinders by skilled technicians, thus assuring deep, positive penetration of the creosote.

Koppers Pressure-Creosoting Treatment provides effective, lasting protection against fungi—the low forms of plant life which cause decay. This treatment also protects piles against termites, and acids or alkalies in the soil.

When Koppers Pressure-Creosoted Foundation Piles are installed, the surrounding earth and concrete caps prevent significant loss of creosote through evaporation. Some creosoted piles, pulled after nearly 50 years' usage, were still "loaded with creosote."



# Economy and Load-Bearing Capacity of Koppers Pressure-Creosoted Foundation Piles

KOPPERS Pressure-Creosoted Piles are low in first cost — usually lower than other permanent pile materials.

Permissible loads of friction piles are not dependent on the type of material. A pressure-creosoted pile supports *just as great a load* as any other type of friction pile of the same size and soil penetration.

For example, creosoted piles driven at Cincinnati

and Albany in permanent foundations were loaded with 35 and 30 tons, respectively. On the other hand, the maximum at New Orleans on some jobs is 12 to 15 tons, regardless of the type of pile that is used.

On Page 12, Koppers describes a specific construction job where each pile carries 30 to 35 tons . . . where tremendous savings were effected by using creosoted timber piles.

TESTING LOAD-BEARING CAPACITY  
OF CREOSOTED PILES.



DRIVING KOPPERS FOUNDATION PILES.





IN ADDITION TO THEIR PERMANENCE ...

THEIR ECONOMY ...

THEIR HIGH LOAD-BEARING CAPACITY ...

KOPPERS PRESSURE-CREOSOTED FOUNDATION PILES

ARE QUICKLY AVAILABLE ... ARE READY TO DRIVE

WHEN RECEIVED ... ARE EASY TO HANDLE

AND DRIVE ... ARE NOT AFFECTED BY ACID

OR ALKALINE SOILS ...

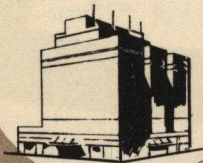
AND DO NOT CORRODE OR SPALL.



# Thousands of varied structures have been **permanently** founded on Pressure-Creosoted Piles

HERE ARE

## THEATERS AND APARTMENT HOUSES



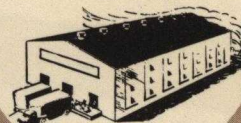
Winfam Realty Corp., Brooklyn, N. Y. • A. J. S. Construction Corp., Jamaica, Long Island, N. Y.  
Garden Apartments, Brooklyn, N. Y. • Waxman Apartments, Brooklyn, N. Y. • Kalicow Corp., Forest Hills, N. Y.  
Corbin Gardens, Brooklyn, N. Y. • Dietrich Apartments, Jackson Heights, N. Y.  
Revere Hall Corp., Forest Hills, N. Y. • Manshore Realty Co., Brooklyn, N. Y.  
Edson Hotel, Beaumont, Texas • El Jardin Hotel, Brownsville, Texas  
Jefferson Theater, Beaumont, Texas • Plaza Theater Bldg., Kansas City, Mo.

## COMMERCIAL AND OFFICE BUILDINGS



Brooklyn Eastern District Terminal, Brooklyn, N. Y. • Union Terminal Buildings, Cincinnati, Ohio  
Walsh Brothers, Long Island City, N. Y. • Sears, Roebuck & Company, Mt. Vernon, N. Y.  
First National Bank Bldg., Beaumont, Texas • Gulf Oil Corporation, Brooklyn, N. Y.  
American Royal Building, Kansas City, Mo. • Dock Board Office Bldg., New Orleans, La. • Walgreen Stores, Chicago, Ill.  
Sobray Whiteman Corp. (New Warsaw Bakery), Brooklyn, N. Y. • Cross Austin and Ireland Lumber Co., Brooklyn, N. Y.

## WAREHOUSES



Brooklyn Waterfront Terminal, Brooklyn, N. Y.  
Richmond Radiator Company, Long Island City, N. Y. (Wall)  
Harris Flooring Company, Long Island City, N. Y.

## HOMES AND HOUSING PROJECTS



U. S. Government, Governors Island, N. Y. • Match Bros., Brooklyn, N. Y.  
Revere Homes, Brooklyn, N. Y. • Winthrop Homes, Brooklyn, N. Y.  
Government Housing Project, Camden, N. J. • North Crest Gardens Corp., Flushing, N. Y.

## INDUSTRIAL BUILDINGS



Coca Cola Building, Beaumont, Texas • Quaker Petroleum Company, Omaha, Nebraska  
Lily Tulip Cup Company, College Point, N. Y. (Storage Bldg.)  
Shell Oil Company, Mt. Vernon, N. Y. (Tank Foundations)  
Consolidated Edison Company, Long Island City, N. Y. (Powerhouse)  
Appleton Mills, Anderson, South Carolina • Natural Gas Compressor Station, Coliata, Kansas  
New Central Concrete Plant, Brooklyn, N. Y. • H. Rosen, Long Island City, N. Y. (Factory)  
Robbins Drydock, Brooklyn, N. Y. (Boiler House) • Viking Forge Co., Brooklyn, N. Y.  
Machinery Builders, Inc., Long Island City, N. Y.  
Henning Brothers and Smith, Brooklyn, N. Y. (Factory)  
Gulf Portland Cement Co., Houston, Texas • Lehigh Portland Cement Co., La Salle, Illinois



# SOME EXAMPLES!

Post Office, Brownsville, Texas • U.S. Immigration Station, Galveston, Texas  
 U.S. Government Buildings, Alameda, California • U.S. Court House, Beaumont, Texas  
 Public Library, Grand Junction, Colorado • U.S. Post Office, Texas City, Texas  
 Texas Prison Farm, Sugarland, Texas • County Court House, Orange, Texas  
 U.S. Forest Service Bldg., Ogden, Utah • U.S. Post Office, Alexandria, Louisiana  
 U.S. Post Office, San Jose, California

## FEDERAL AND MUNICIPAL BUILDINGS

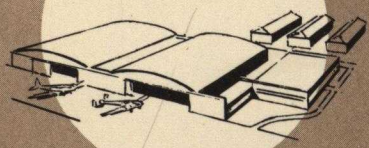


## RAILROAD CONSTRUCTION



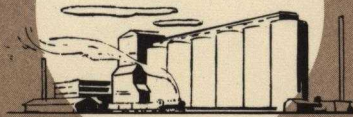
Turntable, Illinois Central System, Champlain, Illinois  
 Train Shed, Illinois Central System, Memphis, Tennessee  
 Coaling Station, Illinois Central System, Denison, Iowa  
 Passenger Station, Illinois Central System, Baton Rouge, La.  
 Station and Powerhouse, Norfolk & Western Railroad, Portsmouth, Ohio

## AIRPORTS



Newark Airport, Newark, N. J. (Bridges) • Idlewild Airport, Jamaica, N. Y. (Sewers)  
 LaGuardia Airport, Queens, N. Y. (Sewers) • Airport Buildings, New Orleans, Louisiana  
 Airport Hangar, Floyd Bennett Field, N. Y.

## TANKS, ELEVATORS AND STACKS



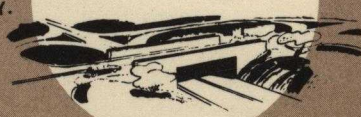
Tar Storage Tank, Philadelphia Coke Co., Philadelphia, Pa.  
 Grain Elevators, Albany Port Commission, Albany, N. Y.  
 175-Ft. Stack, Atlanta, Georgia.  
 Santa Fe Elevator, Argentine, Kansas  
 Sewage Treatment Tanks, Chicago Sanitary District, Chicago, Illinois  
 Ammonia Storage Tanks, Clarksdale, Miss.

## SCHOOLS, CHURCHES AND HOSPITALS



High School, Superior, Wisconsin • Dillard University Buildings, New Orleans, La.  
 Church at Algiers, New Orleans, La. • U. S. Marine Hospital, Galveston, Texas  
 Charity Hospital, New Orleans, La. • Jewish Hospital for Contagious Diseases, Brooklyn, N. Y.

## BRIDGES AND GRADE SEPARATIONS



Grade Separation carrying 28 tracks—N.Y.C., Erie, D. L. & W. and Canadian National R.R.'s, Buffalo, N. Y.  
 Vachel Lindsay Memorial Bridge, Springfield, Illinois  
 6th Street—Minnesota Avenue Viaduct, State Hwy. Depts. of Kansas and Missouri, Kansas City  
 Grade Separation, State Bureau of Roads and Bridges, Omaha, Nebraska





Piles being used in the construction of an extension to runways at Newark Airport, Newark, N. J.



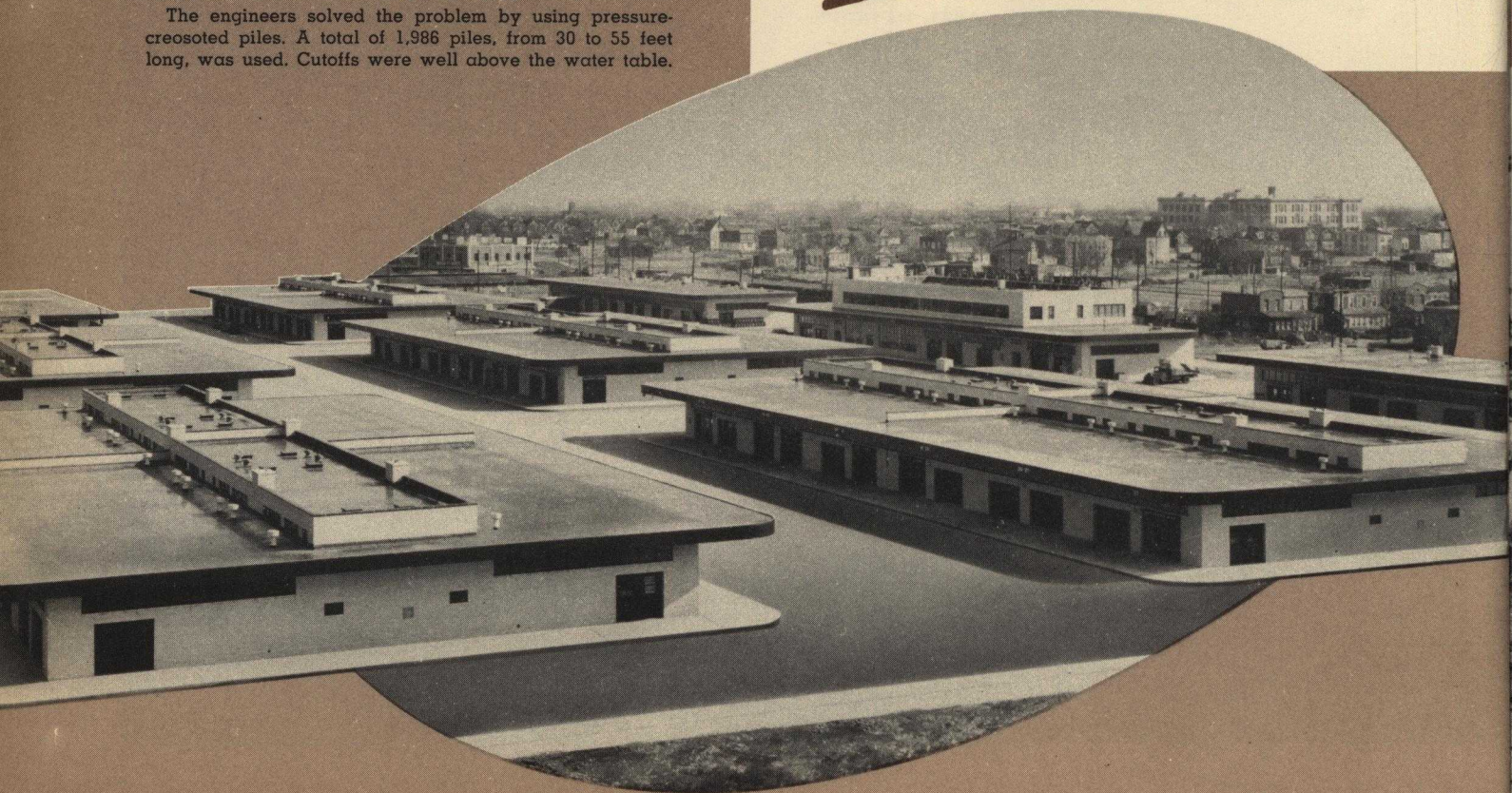
Completed extension to runways.

#### **BROOKLYN TERMINAL MARKET, BROOKLYN, N. Y.**

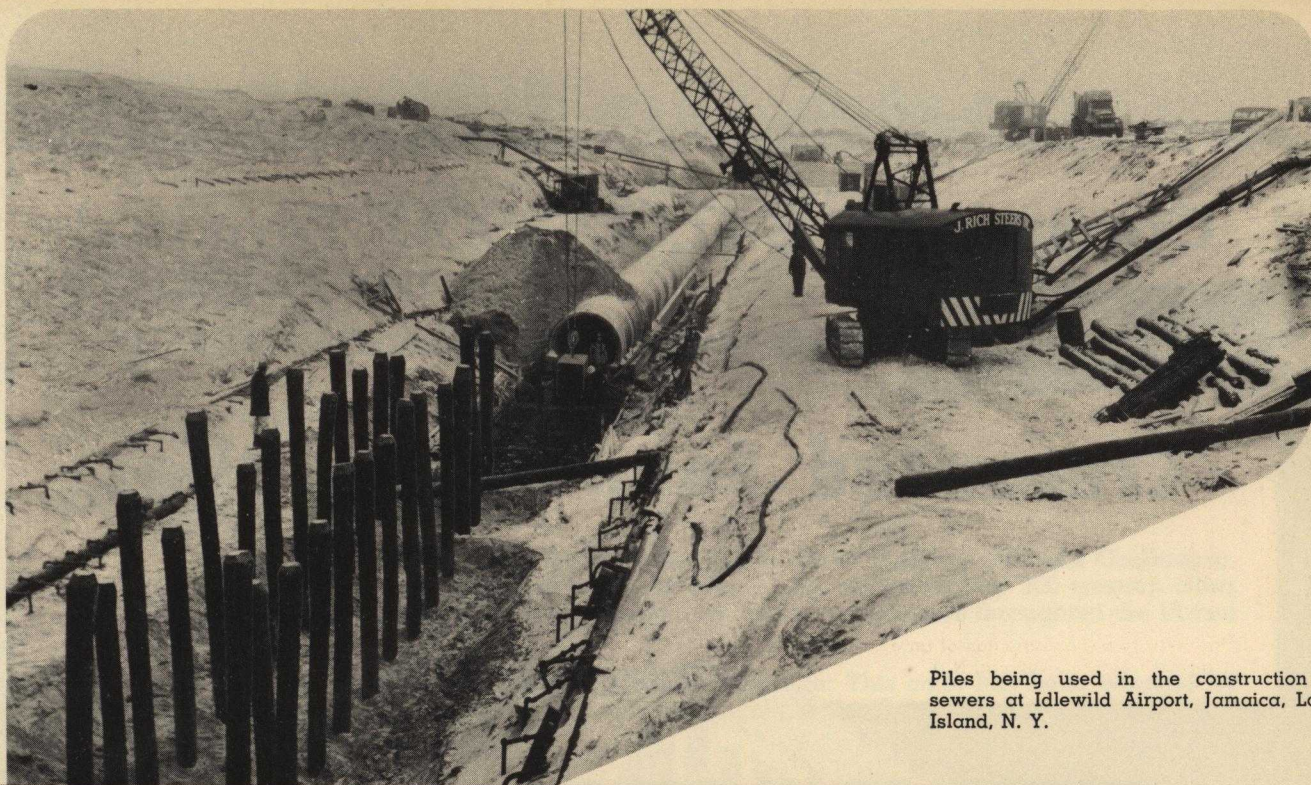
When the City of New York Department of Public Works started construction of the Brooklyn Terminal Market, they found a real foundation problem. Fill had accumulated over the entire site to a depth of 15 to 35 feet. The water table was deep, and records showed a general recession.

The engineers solved the problem by using pressure-creosoted piles. A total of 1,986 piles, from 30 to 55 feet long, was used. Cutoffs were well above the water table.

## *Typical projects*

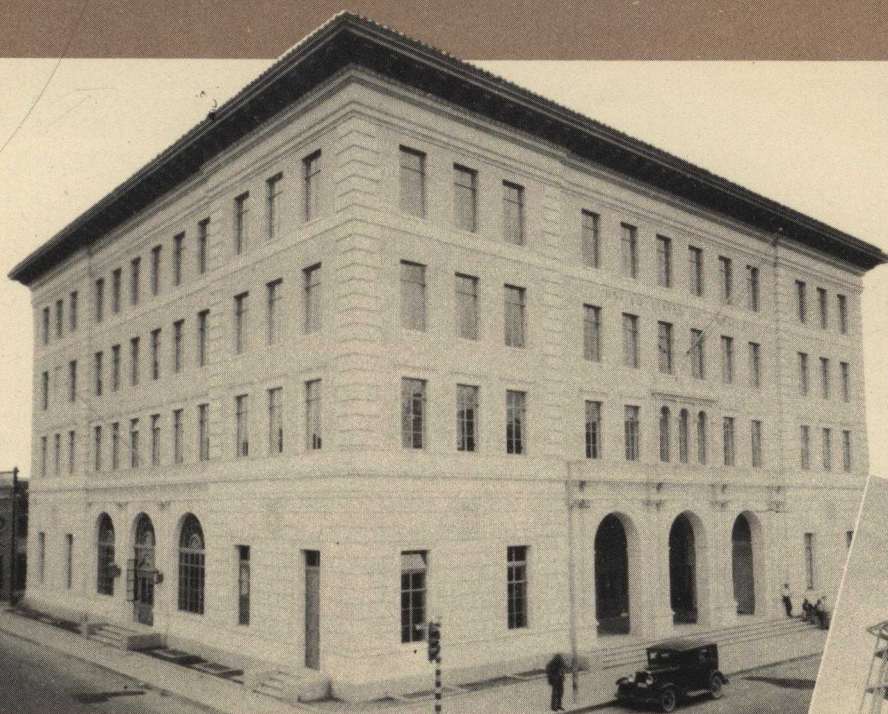




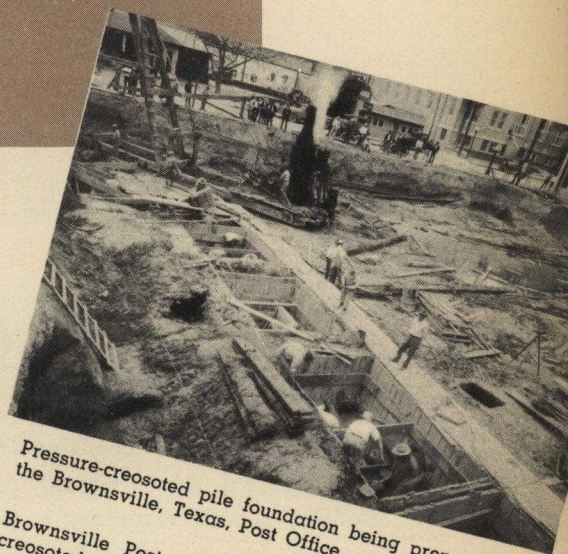


Piles being used in the construction of sewers at Idlewild Airport, Jamaica, Long Island, N. Y.

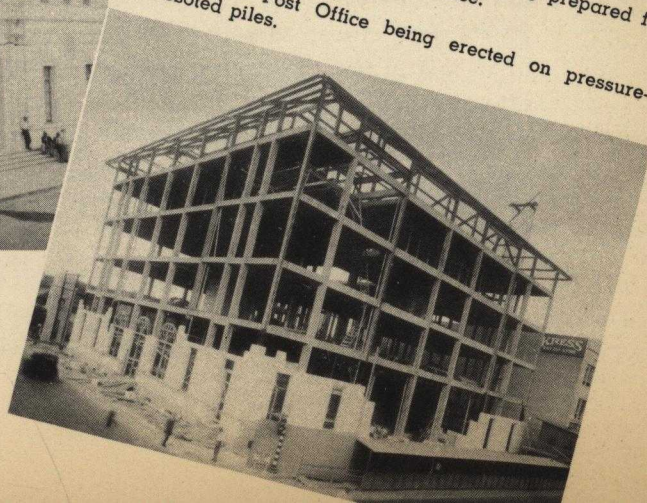
## using Pressure-Creosoted Foundation Piles



Completed U.S. Post Office at Brownsville, Texas.



Pressure-creosoted pile foundation being prepared for the Brownsville, Texas, Post Office.





# Cincinnati's \$41,000,000 Terminal confirms the advantages of using **Creosoted Foundation Piles**

Passenger Station of the Cincinnati  
Union Terminal, Cincinnati, Ohio.



## **Pile Loading 30 to 35 Tons!**

CINCINNATI'S Union Terminal was completed in 1933 at a cost of \$41,000,000. This tremendous railroad terminal was constructed on a filled site; therefore, it was necessary to found almost all of the structures on piling. Of the piles driven, nearly 10,000 were creosoted pine piles, ranging from 45 to 65 feet in length. Today, creosoted foundation piles are still carrying 30 to 35 tons . . . without settlement in the heavy fill.

## **Permanent Construction!**

During the construction of this project, because the heads of all timber piles were so far above ground-water level, engineers of the Terminal Company made an exhaustive study of the permanence of creosoted wood piles. Their conclusion: pressure-creosoted wood, when embedded in earth, regardless of the moisture in the soil, may be considered as permanent construction.

## **Close to \$500,000 Saved!**

Also, competent authorities have estimated that the creosoted timber piles used undoubtedly accounted for a saving of close to \$500,000.



# Important Codes

## Recognize Permanence of Pressure-Creosoted Piles in Building Foundations

### NATIONAL CODES

**UNITED STATES:** National Building Code (1949) of the National Board of Fire Underwriters.

**CANADA:** National Building Code (1942).

### REGIONAL CODES

1. Uniform Building Code (1949) of the Pacific Coast Building Officials Conference. Note: This code has been officially adopted by approximately 300 western cities and towns; it has also been adopted by many communities throughout the United States.
2. Southern Standard Building Code (1948). Note: This code has been adopted by many cities, etc., in the southeastern portion of the United States.

### CODES\* OF REPRESENTATIVE, MAJOR U. S. CITIES THROUGHOUT THE UNITED STATES

New York City	1939 Amendment	Kansas City, Mo.	1946
Administrative Code	1940 Amendment	New Orleans, La.	1949
Philadelphia, Pa.	1949	Dallas, Tex.	1947
Cincinnati, Ohio	1933	Chicago, Ill.	1949
St. Louis, Mo.	1945	*Cutoffs above the permanent ground-water table.	

## Excerpts from Codes Relative to Creosoted Foundation Piles

### 1. 1949 Edition of Uniform Building Code of Pacific Coast Building Officials Conference

#### Section 2807—Piles—"C"—Protection of Pile Materials.

Where the boring records of site conditions indicate possible deleterious action on pile materials because of soil constituents, *changing water levels* or other factors, such materials *shall* be adequately protected by methods or processes approved by the Building Official.

#### "E"—2—Treated Piles

Creosoted piles of Douglas fir or Southern pine shall be treated with Grade 1 creosote.

### 2. New York Code Amendments (1948) Re Pile Foundations.

#### C26-405.0-E-4

Wood piles not impregnated with an approved preservative shall not be used unless the cut-off or top level of the pile is below permanent water table level.

#### C26-405.0-E-5

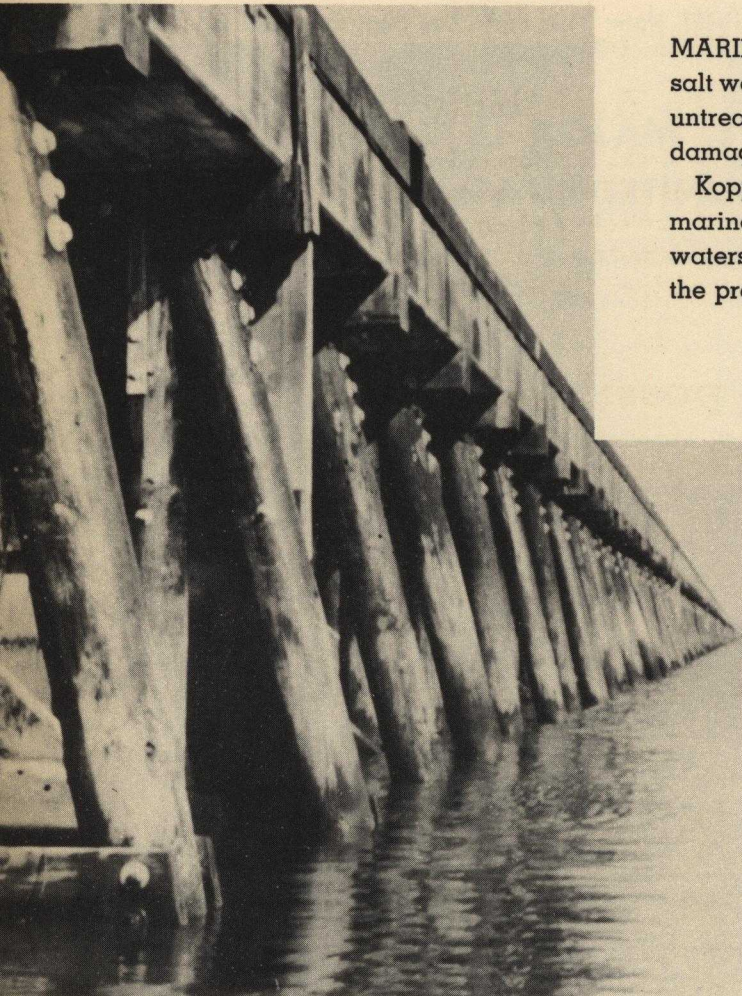
Creosoted timber piles when pressure treated to a final net retention of not less than twelve pounds of creosote per cubic foot of wood may extend above permanent water level when installed and protected in accordance with the following provisions:

- (a) The tops of the cut-off piles shall be below finished ground level and shall be treated with three coats of hot creosote oil and capped with concrete, equal to at least class A concrete as defined in section C26-365.0.
- (b) The preservative shall be grade one coal-tar creosote oil as required by United States federal specification, No. TT-W-571-b. Preservative treatment shall be an empty-cell process, in accordance with the same specification.



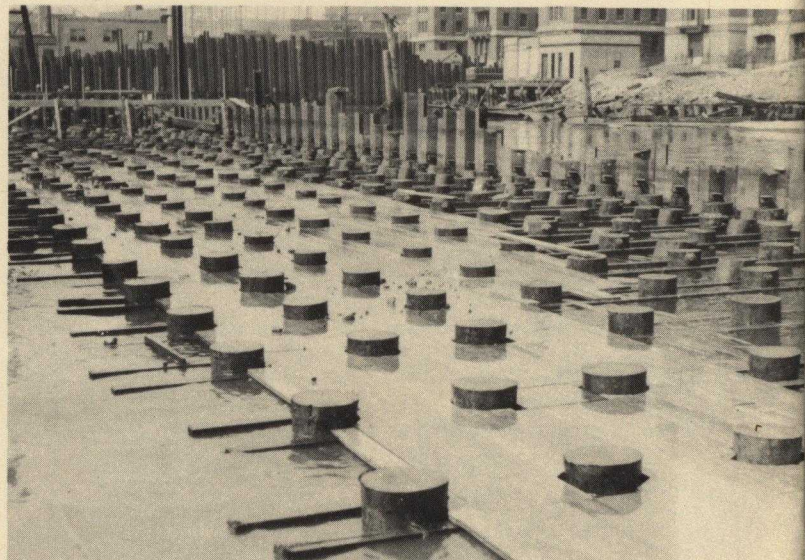
... a few words about marine piles  
**even in salt water, Koppers  
Pressure-Creosoting Treatment**

*Protects Piles*



MARINE BORERS are the greatest threat to untreated wood in salt water. In three to six months, they'll frequently honeycomb untreated piles. In one year, they caused \$3,000,000 worth of damage in a single American harbor.

Koppers Pressure-Creosoting Treatment protects piles against marine borers. For piles, piers, wharves, groins, jetties, breakwaters—in fact, wherever water and construction meet—get the protection that this treatment provides.



These pressure-creosoted piles support a 3-mile pier on the Atlantic Coast—a tremendous pier that carries miles of railroad track, and has facilities for loading a hundred ships at one time. This pier was designed for *permanent* use; therefore, *permanent* materials, including pressure-creosoted piles and other structural members, were specified by the engineers.

Relieving platform that supports New York's East River Drive rests on 72,000 creosoted piles. These piles were driven off-shore in water 20 to 30 feet deep. This 7-mile Drive carries 6-lane, high-speed traffic. For a distance of 4.3 miles, the Drive is supported on relieving platform bulkheads. Wood form, pictured here, carries reinforced concrete slab.

As reported in an article in *Civil Engineering*, April 1949, "Design is based on assumption that creosoted piles used will outlast other materials in structure."



**All Koppers  
Pressure-Creosoted  
Piles  
are now branded!**

KOPPERS now actually burns its brand into every one of its Pressure-Creosoted Piles. In addition to the name KOPPERS—the brand shows the year of treatment, the location of the Koppers Plant where the wood was pressure-treated, the type of preservative and the retention.

The failure of a pile may well be an expensive and serious matter. The Koppers brand is far more than a mark of identification; it is your assurance that you are getting a product that is unvarying in its high quality . . . that, in every way, can be depended upon.

**Availability of Piles**

Large stocks of Koppers Pressure-Creosoted Piles, in all needed sizes, are carried by Koppers. From its 22 strategically-located Wood-Treating Plants, Koppers can make prompt shipment to any section of the United States.

**To give you the best possible service . . .  
Koppers has these 22 Wood-Treating Plants:**

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BRADFORD, PA.  
CARBONDALE, ILL.  
CHARLESTON, S. C.

DENVER, COLO.  
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GREEN SPRING, W. VA.  
GRENADA, MISS.  
HAGERSTOWN, MD.  
HOUSTON, TEX.

KANSAS CITY, MO.  
MONTGOMERY, ALA.  
NASHUA, N. H.  
NEWPORT, DEL.  
NORTH LITTLE ROCK, ARK.  
ORRVILLE, OHIO

RICHMOND, VA.  
RUSSELL, KY.  
SALIDA, COLO.  
SUPERIOR, WIS.  
TEXARKANA, TEX.

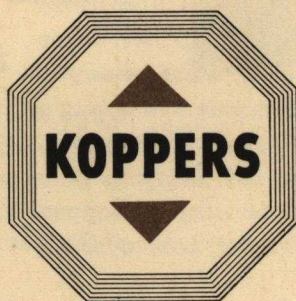
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*The symbol of quality*

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